MORRISON & FOERSTER LLP
MICHAEL A. JACOBS (Bar No. 111664)
mjacobs@mofo.com
MARC DAVID PETERS (Bar No. 211725)
mdpeters@mofo.com
DANIEL P. MUINO (Bar No. 209624)
dmuino@mofo.com
755 Page Mill Road, Palo Alto, CA 94304-1018
Telephone: (650) 813-5600 / Facsimile: (650) 494-0792

BOIES, SCHILLER & FLEXNER LLP
DAVID BOIES (Admitted *Pro Hac Vice*)
dboies@bsfllp.com
333 Main Street, Armonk, NY 10504
Telephone: (914) 749-8200 / Facsimile: (914) 749-8300
STEVEN C. HOLTZMAN (Bar No. 144177)
sholtzman@bsfllp.com
1999 Harrison St., Suite 900, Oakland, CA 94612
Telephone: (510) 874-1000 / Facsimile: (510) 874-1460
ALANNA RUTHERFORD (Admitted *Pro Hac Vice*)
575 Lexington Avenue, 7th Floor, New York, NY 10022
Telephone: (212) 446-2300 / Facsimile: (212) 446-2350 (fax)

ORACLE CORPORATION
DORIAN DALEY (Bar No. 129049)
dorian.daley@oracle.com
DEBORAH K. MILLER (Bar No. 95527)
deborah.miller@oracle.com
MATTHEW M. SARBORARIA (Bar No. 211600)
matthew.sarboraria@oracle.com
500 Oracle Parkway, Redwood City, CA 94065
Telephone: (650) 506-5200 / Facsimile: (650) 506-7114

Attorneys for Plaintiff
ORACLE AMERICA, INC.

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

ORACLE AMERICA, INC.

Plaintiff,

v.

GOOGLE, INC.

Defendant.

Case No. CV 10-03561 WHA

DECLARATION OF STEVEN M. SHUGAN IN SUPPORT OF OPPOSITION TO GOOGLE'S THIRD DAUBERT MOTION

Dept.: Courtroom 8, 19th Floor
Judge: Honorable William H. Alsup

I, STEVEN M. SHUGAN, declare as follows:

1. I have been retained by Oracle America, Inc. ("Oracle") as an expert in this matter. My background and qualifications, the terms of my retention, and the documents I have reviewed are set forth in the Expert Report I submitted in this matter on September 12, 2011, and in declarations I submitted on October 21, 2011, and November 1, 2011; I incorporate those documents herein by reference. (*See* Expert Report of Professor Steven M. Shugan (Sept. 12, 2011) ("Shugan Report") p. 1–2; App'x A, B, C; Declaration of Steven M. Shugan In Support Of Oracle America, Inc.'s Motion to Exclude The Expert Reports Of Gregory K. Leonard and Alan J. Cox (Dkt. No. 560); Declaration in Support of Oracle America, Inc.'s Reply To Google, Inc.'s Opposition to Motion to Exclude Portions of the Expert Reports of Gregory K. Leonard and Alan J. Cox, November 1, 2011, p. 8-10. (Dkt. No. 595.) In addition to these materials, I submitted a Reply Report in this matter on October 10, 2011 (Expert Reply Report of Professor Steven M. Shugan ("Reply Report")), which I am providing to the Court as Exhibit A to this Declaration. I incorporate by reference all of the analyses I performed in each of the four documents referenced in this paragraph, for completeness.

2. To review my qualifications in brief, I am currently the McKethan-Matherly Eminent Scholar and Professor at the University of Florida, where I teach multivariate statistics, marketing models and advanced marketing management. I hold a Ph.D. in Managerial Economics from Northwestern University and my research includes services marketing (integrating operations), statistics, metrics, entertainment marketing, advance-selling, normative methods for modeling competition, markets for evaluative information, and models of selling and product policy. I was formerly a full professor at the University of Chicago for 13 years, and I have taught marketing, econometrics, statistics, and computer science at various universities.

3. I was editor-in-chief of *Marketing Science* for six years, editor of *Journal of Business* and associate editor of *Management Science*, and I served on over 10 editorial boards including the *Journal of Consumer Research*, *Journal of Marketing* and *Journal of Marketing Research*. I have numerous publications (including 27 editorials and commentaries) and have made over one hundred professional presentations in more than 22 countries. Much of my work involves the evaluation of marketing research tools including surveys.

4. My fields of specialization within marketing include marketing strategy, marketing research, quantitative models, and consumer decision making. In the course of my scholarly research, teaching, editorial work, and consulting work, I have studied issues of marketing research, product design, product and feature development, branding, and pricing, and their roles in consumer preferences and choice. During my career, I have taught managers, M.B.A. students, and doctoral students about, written textbook chapters on, evaluated articles for publication on, and conducted conjoint analysis.

5. I was asked by counsel for Oracle to evaluate consumer preferences for certain smartphone features. Specifically, Prof. Iain Cockburn, on behalf of Oracle, asked me to conduct a conjoint study that evaluates the effect of particular features on the demand for smartphones, including those devices that run the Android operating system. (Shugan Report p. 3.) I conducted the survey at his direction, and reported the results of the survey and my analysis thereof in the Shugan Report, which I filed on September 12, 2011. I submitted a Reply Report on October 10, 2011, responding to certain critiques from Google's damages expert, Dr. Gregory Leonard. I have not revised either report since then.

6. I understand that Google has moved to exclude the conjoint analysis, claiming that the analysis is unfit for litigation and had certain methodological flaws. (Google's Motion to Strike Portions of Third Expert Report by Iain Cockburn And Expert Report by Steven Shugan. (Dkt. No. 720).) At the request of counsel for Oracle, I address certain issues raised by Google in that motion.

A. Google misunderstands the market share analysis I performed.

7. Google claims that "Dr. Shugan essentially converts the consumers' preference share into projected market shares—essentially, he concludes that, if 20% of consumers value application start time more than other tested features, an increase in application start time on Android phones would mean a 20% drop in Android market share."[1]

[1] Google's Notice of Motion and Motion to Strike Portions of Third Expert Report by Iain Cockburn and Expert Report by Steven Shugan; Memorandum of Points and Authorities in Support Thereof, Oracle America, Inc. v. Google, Inc., Case No. 3:10-cv-3561-WHA, N.D. Cal, San Francisco Division, February 17, 2012 ("Google's Motion to Strike"), p. 15.

8. Google's assertion is incorrect. It demonstrates a lack of knowledge of the analysis that I undertook and, more generally, of how conjoint studies are typically used to evaluate new products and features. Google misunderstands and mischaracterizes my standard market share analysis. Exhibit 3a to the Shugan Report concludes that an incremental change to the application start time on an Android device from two to four seconds would decrease sales by 20 percent. This 20 percent change is the result of estimating, based on the choices respondents made in the study, the number of buyers who would select a different phone when the start up time is changed by two seconds. Thus, the analysis estimates preference share movements when changing from one level to another within one feature, holding all other features and levels constant. It is nonsensical to conclude that this result occurs because 20 percent of consumers value application start time "more than other tested features," when those "other features" are held constant within the model.

9. Contrary to Google's assertions, my conjoint study does not simply convert feature importance into preference share changes. It relies on the expected distribution of respondent choices given that a particular set of profiles were available in the market place. Each respondent's set of preferences in the various scenarios is evaluated such that the most preferred profile, characterized by all seven features, including application start time, is identified for that respondent. By summing these selections for all respondents under the two scenarios, with different start times for Android devices, holding all else equal, I am able to evaluate the expected loss in market share using standard analyses with standard software.

B. Conjoint analysis has been accepted by marketing professionals, academics, and courts.

10. Conjoint analysis is a combination of data collection through surveys and analysis of the data provided by respondents using standard, well-tested methods relied upon by academics and commercial entities for more than 40 years.

11. Specifically, conjoint analysis employs a two-step procedure, both of which have been widely employed in litigation. In the first step, data are collected using standard survey methods. Consumers are simply asked to choose among different sets of "products" defined by different features levels. In the second step, the data is analyzed using a standard choice modeling technique,

using commercially available and publicly tested software, to analyze survey data. In this case for the data analysis, I used a logit model, which is a type of regression model, in a software package developed by Sawtooth Software Inc. ("Sawtooth Software").

12. Sawtooth Software is a leading provider of software packages used by marketing researchers and ultimately relied upon by corporations for making numerous product development and marketing decisions. Sawtooth Software developed the most commonly used software to conduct conjoint analysis. The software package was created with the assistance of leading academics in the field of Bayesian analysis and is constantly being improved and enriched in its capabilities based on the input that Sawtooth Software receives from academics and practitioners during seminars and conferences that the firm organizes.[2] Because of Sawtooth Software's close connection to the academic world, the software is highly reliable and provides accurate results.

13. Software developed by Sawtooth Software has been used in litigation matters before and specifically for the assessment of damages. Bryan Orme, the current President of Sawtooth Software, states in his introductory book on conjoint analysis that conjoint analysis is used in the assessment of damages in litigation matters.[3]

14. Well-known academics have also noted the use of conjoint surveys in litigation matters: "In addition to the use of conjoint analysis for marketing and strategic analysis, its applications are becoming increasingly diverse. One area of growing interest is litigation. Recently, conjoint studies provided primary input to the settlement of disputes in the telecommunications (foreign dumping of equipment in the U.S.), Pharmaceuticals (lost profits through misleading competitive product claims), and airline (alleged brand position bias in travel agents' reservation computer screens) industries."[4]

---

[2] Bryan Orme, "Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research," Second Edition, *Research Publishers LLC*, 2010, pp. 29-37.

[3] Bryan Orme, "Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research," Second Edition, *Research Publishers LLC*, 2010, p. 137.

[4] Green, P.E. and V. Srinivasan, "Conjoint Analysis in Marketing: New Developments with Implications for Research and Practice," *Journal of Marketing*, October 1990, pp. 3-19 at 15.

15. According to Green, Krieger, and Wind, conjoint analysis has been used in the following cases:[5]

- Antidumping litigation – AT&T vs. Pacific-rim manufacturers legal dispute regarding small business telephone equipment; case adjudicated in AT&T's favor
- Intermittent windshield wipers litigation – study to determine consumer evaluations of the derived "willingness to pay" for the intermittent wiper feature
- Continental vs. American Airlines litigation – conjoint study of travel agents' trade-offs among airline flight selections
- TiVo v. EchoStar, in the Eastern District of Texas
- U-Haul Int'l v. Jartran Inc., in the District of Arizona
- Robert Kearns v. Ford Motor Co, in the Eastern District of Michigan

16. Furthermore, conjoint analysis has also been used in reports that were submitted to Congress and used by the U.S. Navy: [6]

- Health maintenance plans: study conducted by the American Association of Retired Persons; results submitted to Congress
- U.S. Navy benefit packages for reenlistment: conjoint used to develop menu of new reenlistment plans based on individual differences in types of duties, health needs, and sign-over bonuses.

C. Conjoint analysis is frequently used in practice to model consumer behavior.

17. Google claims that "[c]onjoint analysis measures consumer preference for product features; it does not capture how consumers actually behave when purchasing a product. Consumers' stated preference for a given feature may be one of many factors a company considers in designing or launching a new product, but they are not a proxy for market share."[7] In fact, conjoint analysis has

---

[5] Green, P.E., A.M. Krieger, and Y. Wind, "Thirty Years of Conjoint Analysis: Reflections and Prospects," *Interfaces*, Vol. 31, No. 3, Part 2 of 2, May-June 2001, pp. S56-S73 at S67.

[6] Green, P.E., A.M. Krieger, and Y. Wind, "Thirty Years of Conjoint Analysis: Reflections and Prospects," *Interfaces*, Vol. 31, No. 3, Part 2 of 2, May-June 2001, pp. S56-S73 at S67.

[7] Google's Motion to Strike, p. 16.

been used by firms and other organizations in deciding the specific design features of multi-million dollar projects as it is widely recognized as a reliable tool for predicting consumer behavior:

- Marriott used conjoint analysis to design Courtyard Marriott hotels, "an 'optimal' hotel chain catering primarily to business travelers who had no need for many of the features provided by up-scale hotels, such as Marriott and Hyatt."[8] Most of the design recommendations from the conjoint analysis were used to create the Courtyard Marriott and by 2001, there were 450 Courtyard Marriott locations worldwide "with annual sales in the billions of dollars."[9] Marriott has continued to use conjoint analysis in other projects, such as "designing time-share vacation units and in room and amenities pricing."[10]
- General Motors Corporation has used conjoint analysis since the early 1970s. Conjoint analysis has been used for "products such as the Cadillac Northstar engine, OnStar, XM Radio, Bumper to Bumper warranty, as well as many vehicles, such as the Chevrolet Avalanche."[11]
- Boeing Employees Credit Union, which is the fifth largest credit union in the United States with 385,000 members, used conjoint analysis to estimate members' preference for money market accounts versus regular saving accounts.[12]

18. Additionally, the external validity of conjoint analysis has been demonstrated in several circumstances. Several applications in industry, in which conjoint analysis has been applied,

---

[8] Green, P.E., A.M. Krieger, and Y. Wind, "Thirty Years of Conjoint Analysis: Reflections and Prospects," *Interfaces*, Vol. 31, No. 3, Part 2 of 2, May-June 2001, pp. S56-S73 at S67.

[9] Green, P.E., A.M. Krieger, and Y. Wind, "Thirty Years of Conjoint Analysis: Reflections and Prospects," *Interfaces*, Vol. 31, No. 3, Part 2 of 2, May-June 2001, pp. S56-S73 at S68.

[10] Green, P.E., A.M. Krieger, and Y. Wind, "Thirty Years of Conjoint Analysis: Reflections and Prospects," *Interfaces*, Vol. 31, No. 3, Part 2 of 2, May-June 2001, pp. S56-S73 at S68.

[11] Orme, B., Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research , Second Edition, *Research Publishers LLC*, 2010, p. 130.

[12] Orme, B., Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research , Second Edition, *Research Publishers LLC*, 2010, p. 132.

have confirmed ex-post that the predictions from conjoint analyses were close to how the market actually behaved after the respective products had been introduced:

- EZ-Pass toll collection project used conjoint analysis to determine how EZ-Pass should be configured and what level of resources should be allocated to its implementation: "The overall (at equilibrium) forecast made in 1992 of 'take rate' was 49-percent usage. The actual take rate (seven years later) was 44 percent; future usage is expected to be higher than 49 percent."[13]
- "Robinson (1980) reports a multinational conjoint study of North Atlantic air travel involving airfares, discounts, and travel restrictions. His results indicate that conjoint analysis had a substantial ability to predict market shares. Srinivasan et al. (1981) describe a conjoint study of individually computed conjoint functions that are used to predict work-trip modes (auto, public transit, and car pool). Travel mode shifts were forecasted for various policy-level gasoline tax surcharges. The authors' forecasted results were roughly consistent with the actual subsequent increase in transit ridership resulting from a serendipitous rise in the price of gasoline. Benbenisty (1983) describes a conjoint study involving AT&T's entry into the data terminal market. The simulator forecasted a share of 8% for AT&T four years after launch. The actual share was just under 8%."[14]
- Sunbeam Appliance Co. used conjoint analysis in conjunction with market research and product line simulations in redesigning its product lines. "The correlation between the predicted brand shares and the reported shares was very high (r = .96), which builds confidence in the quality of the market share predictions produced from the conjoint based simulations."[15]

---

[13] Green, P.E., A.M. Krieger, and Y. Wind, "Thirty Years of Conjoint Analysis: Reflections and Prospects," *Interfaces*, Vol. 31, No. 3, Part 2 of 2, May-June 2001, pp. S56-S73 at S68.

[14] Green, P.E. and V. Srinivasan, "Conjoint Analysis in Marketing: New Developments with Implications for Research and Practice," *Journal of Marketing*, October 1990, pp. 3-19 at 13.

[15] Page, Albert L. and Harold F. Rosenbaum, "Redesigning Product Lines With Conjoint Analysis: How Sunbeam Does It," *Journal of Product Innovation Management*, Vol. 4, 1987, pp. 120-137 at 120.

D. Google misunderstands the design of my survey.

19. Google claims that "Dr. Shugan used respondents' selections to rank and measure the relative importance of the seven features to consumers. He then plugged these ranked values—referred to in conjoint parlance as 'partworths'—into a statistical software program in order to assess general consumer preference for an Android phone lacking the application volume, startup time, and multitasking capabilities allegedly provided by the patents- and copyrights-in-suit." [16]

20. Google misunderstands and misstates the analysis that I conducted. I calculated partworths using the most widely recognized and used regression-based statistical model for evaluating respondent choices in the framework of choice-based-conjoint. These partworths are not "ranked values," rather they are coefficients from the Hierarchical Bayes regression estimation based on the actual "choices" respondents made in the conjoint exercise. This misstatement further demonstrates that Google's counsel and experts do not understand the fundamentals of choice-based conjoint analysis. The "partworths" are not plugged "into any statistical software," they are the coefficient estimates generated through regression analysis based on the data from the choices made by respondents over 16 choice tasks. They are not generated from simple rankings or from the assignment of points to various features or feature levels. Conjoint analysis is used because it allows one to analyze how features contribute to actual decision making when the relevant set of features are considered jointly.[17]

E. The selection of features for the conjoint survey was methodologically proper.

21. Google attacks the choice of features in my survey. Google's attack mischaracterizes my analysis and misses the point of conjoint analysis.

22. First, Google falsely characterizes my description of how I selected the features and feature levels to be included in my 2011 Smartphone Survey. While I clearly included the features that were relevant to Oracle's case and to Professor Cockburn's analyses, I first confirmed that these

---

[16] Google's Motion to Strike, p. 17.

[17] Green, Paul E., Abba M. Krieger, Yoram Wind, "Thirty Years of Conjoint Analysis: Reflections and Prospects," *Interfaces*, Vol. 31, No. 3, Part 2 of 2, 2001, pp. S56-S73.

features were relevant to consumer choice. I testified in deposition that I relied upon several sources in making his decision of which features and feature levels to include:

> Q. Do you recall who communicated to you specific features that ought to be included in the conjoint analysis?
>
> A. Well, the -- your question is not really clear in the sense that there are different features in the analysis. Now, some of the features were communicated to me through Analysis Group that they were required features and need to be there. Other features I decided should be there, and there were other features that Cockburn decided needed to be there. And **then in the end, I put it all together and decided which ones to actually include in the analysis. So the -- there wasn't one source where all of the features came from**.[18] (emphasis added.)

23. Second, as I explained in the Shugan Report, Reply Report, and deposition, in addition to speaking with Professor Cockburn, I considered interviews, market research, and a focus group to identify the relevant features and their levels to be included in his 2011 Smartphone Survey. Exploratory interviews determined what product characteristics matter to consumers' smartphone selections and the appropriate vocabulary for the questionnaire. I explained the purpose of the exploratory interviews in deposition:

> Q. BY MR. PURCELL Did you formulate a list of questions that then went into the one-on-one interviews?
>
> A. **Yeah, basically the major use of that research was to identify the features that consumers would likely use in choosing between smartphones. And specifically my goal in this was to try at the end of the process to come up with the most important features so that we could identify the relative importance of the features involved in the case, that is, the ones involved in the patent and copyright infringement and how those -- important those would be compared to the important features.** We wouldn't be really that concerned about how important

[18] Deposition of Steven M. Shugan, Ph.D., September 26, 2011, p. 29.

they were compared to the unimportant features, but important to the relevant features, and then be sure to include the least to most important of the features in the conjoint analysis, mainly, as I say, to explain variants and decrease the variability of the estimates more than it is to change the estimates. The other objective, the main objective was to -- in the focus groups, to be able to provide aided recall measures, where you actually tell people -- I think we had -- in different categories, we had people that, you know, that we asked them, you know, if you were considering this phone, would you consider the attribute, and then if you were a purchasing decision, would that be something that would be involved in a purchase decision. And then the aided recall requires certain -- you go into the focus group with sort of some attributes that you could cue people on. But first they were asked the unaided before the aided.[19] (emphasis added.)

24. I complemented this qualitative research with a review and analysis of third-party sources that provided further information about the attributes that consumers consider when selecting a smartphone and confirmed that the feature enhancements enabled by the patents-in-suit and the Java copyrights are relevant to their decisions. Specifically, I reviewed industry analyst reports and buyers' guides to determine how manufacturers differentiated their smartphones and underlying operating systems and which product features were emphasized in product reviews.[20]

Q. What was done to prepare for the conduct of that focus group?

A. **To prepare for the focus group, there was background research done by myself and Analysis Group looking at the literature and publicly available information on smartphone purchases, specifically looking for the attributes that**

---

[19] Deposition of Steven M. Shugan, Ph.D., September 26, 2011, pp. 40-42.

[20] See for example, "J.D. Power and Associates Reports: Average Length of Time Wireless Customers Keep Their Mobile Phones Increases Notably," *J.D. Power and Associates*, September 23, 2010; and "Top Reasons for Choosing Device – Smartphone vs. Feature Phone: What Were the Top 3 Reasons for Selecting Your Current Cell Phone?" *The Nielsen Company*, 2011, http://www.fiercemobilecontent.com/pages/nielsen-top-reasonschoosing-device-smartphone-vs-feature-phone.

> **were identified by either reviewers of smartphones, manufacturers of smartphones in their advertising, the consumers, any surveys that have taken place, and I believe it was also some quality -- companies that were looking at the qualities of various phones, the information, or a good sample of that information, including expert report.** And then I also had some personal knowledge, as other people did, of smartphones, given that the category is a fairly common one. And then the focus group was set up. It was also -- before the focus group, it was done one-on-one in reviews with customers to sort of look at their purchasing decision. People who have recently purchased phones and what attributes they considered. I think there were seven one-on-one decisions within six people in the focus group. The focus -- the one-on-one decisions and focus group decisions are complementary in the sense that their goal was to identify an exhaustive set of features with aided and unaided recall, unaided recall being consumers just being asked what they considered, and aided recall being here are some features, which ones of these did you consider. And then that was sort of the preparation for the focus group.[21] (emphasis added.)

25. Additionally, I did, in fact, include several features in my survey that are not at issue in this litigation. Importantly, it is not necessary in conjoint analysis to test every feature that may matter to consumers, because conjoint analysis assesses ***relative*** importance. I took this additional step to estimate a well-specified model. After I identified 36 features that real-world consumers said were important in making a purchasing decision, I intentionally, and conservatively, included in my survey the two features that consumers cared about most: brand and price, among other features consumers in the focus groups indicated that they required. This approach is methodologically sound, as I included the two most critical features that generally derive the greatest value in any estimation and that capture the benefits of Google's reputation. Further, including brand in 2011 is conservative, as it allows Google to benefit from Android's reputation for feature-rich devices with

[21] Deposition of Steven M. Shugan, Ph.D., September 26, 2011, pp. 39-40.

broad applicability (i.e., wide availability of applications) built, in part, off of its infringement of the patents and copyrights in suit.

F. Google does not understand the difference between choice-based conjoint and self-explicated approaches.

26. Google quotes a comment made by Judge Posner in the *Apple v. Motorola* case regarding the use of consumer surveys to measure the value of a patent. The approach that Judge Posner was commenting on is referred to as a self-explicated approach, where respondents are asked to evaluate the levels of each feature one-by-one and then asked to allocate a number of points, e.g., 100, across all features to represent their relative importance to the respondent. In contrast, the choice-based conjoint approach uses choice exercises that ask a respondent to perform repeated choice tasks. In each choice task, respondents are asked to choose their most preferred product from among several products (i.e., a set of products) where each product is described in terms of the product's features. I did not use the approach that Judge Posner objected to in the *Apple v. Motorola* case. In fact, I testified in deposition that I considered using a self-explicated approach, but I dropped the approach in favor of using the choice-based conjoint approach.[22] As noted above, a choice-based-conjoint study is optimal for this type of analyses, as it avoids the artificial "focus" that a self-explicated method may require. By presenting product profiles characterized by both the features that are relevant to the copyright and patent allegations in this case and features that are generally considered by consumers when making decisions (e.g., brand and price), I did not draw specific attention to the features at issue in this case. They are presented as part of a broader product profile.

[22] Deposition of Steven M. Shugan, Ph.D., September 26, 2011, pp. 24-25.

G. I did evaluate the "incremental benefit" of phone features.

27. Google claims that my study "measures the value consumers place on certain phone ***features*** as a whole, rather than the incremental benefit to those features allegedly enabled by the ***technology*** at issue." [23] (emphasis in original.) This statement is false.

28. Again, Google has failed to understand how my data and analyses function. The conjoint study created a "set of utilities or part-worths that quantify respondents' preferences for each level of each attribute."[24] With this data on individuals' partworths, I utilized a market simulator to simulate respondents' market choices among a set of defined products characterized by both product features and the differentiated feature levels.[25]

29. Using the market simulator tool, I evaluated how preference shares for an Android device changed depending on whether the patented technologies were enabled ("Base case") or disabled ("Scenario 1," "Scenario 2," and "Scenario 3"). (See Exhibit 3a to the Shugan Report.) By altering the levels of only one or two features at a time, the preference shares between the base case and various alternative scenarios could be compared to measure precisely the incremental benefit (or cost) of those feature level changes.[26] According to Bryan Orme, this "one-attribute-at-a-time

---

[23] Google's Motion to Strike, pp. 18-19.

[24] Orme, B., Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research, Second Edition, *Research Publishers LLC*, 2010, p. 89.

[25] "The simulator is used to convert raw conjoint (part-worth utility) data into something much more managerially useful: simulated market choices. Products can be introduced within a simulated market scenario and the simulator reports the percentage of respondents projected to choose each product. A market simulator lets an analyst or manager conduct what-if games to investigate issues such as new product design, product positioning, and pricing strategy." (Orme, B., Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research, Second Edition, *Research Publishers LLC*, 2010, pp. 89 and 91.)

[26] "Conducting sensitivity analysis starts by simulating shares of choice among products in a base case market. Then, we change product characteristics one level at a time (holding all other attributes constant at base case levels). We run the market simulation repeatedly to capture the incremental effect of each attribute level upon product choice." (Orme, B., Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research, Second Edition, *Research Publishers LLC*, 2010, p. 81.)

approach to sensitivity analysis provides a good way to assess relative preferences of product attributes."[27]

30. Contrary to Google's assertions, the simulation results presented in my report, on which I understand Prof. Cockburn relied, do not measure the benefit of the at-issue features as a whole, as I do not consider Android phones with and without applications – I consider Android phones with varying speeds of application launch times and varying numbers of available applications.

31. Google may have confused the simulation results reported in Exhibits 3a – 4c of my Expert Report (on which I understand Prof. Cockburn relied) and the results reported in Exhibit 5 of my Expert Report which measure the relative importance of each feature as a whole. This particular analysis was not created for the purpose of estimating preference shares but rather to demonstrate stability across sample sensitivities; I understand that these results are not relied upon by Prof. Cockburn in his analysis.

H. I never "conceded" that the survey respondents did not hold levels constant.

32. Google claims that my instruction to survey respondents to "[a]ssume any features not listed are the same for all alternatives" "undermines the survey's ability to predict real-world behavior."[28] This critique is not valid as researchers have found that respondents are able to consider such hypotheticals.[29]

33. Google argues that survey respondents did not hold constant those variables that were not part of the conjoint analysis's choice task. Google misconstrues the following excerpt from my Reply Report to support its argument: "For example, respondents will tend to implicitly attribute to

---

[27] Orme, B., Getting Started with Conjoint Analysis: Strategies for Product Design and Pricing Research, Second Edition, *Research Publishers LLC*, 2010, p. 84.

[28] Expert Report of Steven M. Shugan, Appendix E, p. E-19; and Google's Motion to Strike, p. 18.

[29] See for example Wilhelm, W.B., "Encouraging Sustainable Consumption through Product Lifetime Extension: The Case of Mobile Phones," *International Journal of Business and Social Science*, Vol. 3, No. 3, February 2012, pp. 17-32 at 22.

the brand name any excluded attributes."[30] Google mistakenly characterizes this statement as a concession that, contrary to the survey instructions, participants in my survey did not hold constant the non-included features that might be relevant to a smartphone purchase. That is not the case. When respondents implicitly attribute aspects of other attributes to brand name it is not inconsistent with holding constant all other variables that are not included in the conjoint study. There is no reason to believe that respondents who do enrich the value of the brand name with variables not included in the conjoint study vary their evaluation of brand between the 16 choice sets from which they choose their preferred smartphones. Therefore, even if respondents enrich the value of brand, I am still able to isolate the incremental benefit of the features at issue accurately. In other words, the meaning of price and brand may differ slightly for some consumers, but each individual consumer will have a constant view of the meaning of price and brand as they make their choices in the survey. Moreover, as I explained in my Reply Report, some of the value intrinsic to the patents and copyrights at issue as well as variables not included in the conjoint study may likely be captured in the Android brand feature level and would lead to my estimates of the value intrinsic to the patents and copyrights at issue to be understated.[31] The same rationale applies to the price feature: should price capture any other attributes, such as quality, my market share simulation would lead to my estimates of the value intrinsic to the patents and copyrights at issue to be understated**.**

I. Google fails to show that respondents did not follow my instruction to hold constant all unnamed features.

34. Google presents no support to demonstrate that survey respondents did not follow my instruction to hold any features not listed constant. In fact, the stability of my results and the accurate representation of real-world market shares by my preference shares in the base case is a strong signal

[30] "Such an effect would increase the value of the Android brand name, and so such biases would reduce the value of the relevant features." (Reply Report, Exhibit A, pp. 17.)

[31] Shugan Report, pp. 16-17.

that the data was collected without deviating from scientific standards and resulted in reliable estimates.[32]

35. Google ignores this external validation, however, and instead states that "almost one quarter of all respondents **claimed that they would prefer a smartphone costing $200 to a putatively identical smartphone costing $100**."[33] (emphasis added.) What Google offers as "proof in the pudding"[34] is not only technically wrong, but it is also a gross misstatement of my survey. First, I did not use any open-ended question that would have allowed respondents to express their preferences directly. Consequently, no respondent "claimed" to prefer a smartphone costing $200 to a similar one that costs $100. Second, my survey purposefully avoids statements in which respondents explain their preferences, opinions, or perceptions. Instead, respondents' choices are used in a statistical, regression-based model to generate a distribution of partworths that finally – in their entirety – are used to predict preference shares in a simulated market. Notably, such preference shares have been shown in many cases to reflect market shares; and if they do so, they offer a statistically valid and reliable description of a market in either the real world or in a but-for world. In this case, the market shares were within a rounding error of the real world market shares, suggesting that respondents understood the instructions and were able to "hold all else constant." The evidence Google supposedly provides is based on flawed analyses and flawed logic.

36. Google claims that "[n]o rational person, much less 24% of all rational people, would prefer to pay $200 for a phone they could have for $100."[35] I responded to this argument in my

---

[32] Kellogg, Don, "In U.S. Market, New Smartphone Buyers Increasingly Embracing Android," *NielsenWire*, September 26, 2011, http://blog.nielsen.com/nielsenwire/online_mobile/in-u-s-market-new-smartphone-buyersincreasingly-embracing-android/; and Exhibit 3a to Expert Report of Professor Steven M. Shugan. "One, I forecasted or predicted what the actual market shares could be from the conjoint analysis and found that the observed shares in the market were very close to what the conjoint analysis predicts they should be." (Deposition of Steven M. Shugan, Ph.D., September 26, 2011, p. 115).

[33] Google's Motion to Strike, p. 19.

[34] Despite claiming to present a proof, Google presents a proposition that indicates a lack of understanding not only of the concept of (scientific) proof, but also of the estimation and the interpretation of the estimation of partworths in a choice model. (Google's Motion to Strike, p. 19.)

[35] Google's Motion to Strike, p. 19.

declaration from November 1, 2011, as well as in my Reply Report, and I incorporate those documents herein by reference. (*See* Exhibit A.)

37. In the declaration to which I responded in November 2011, Dr. Leonard pointed out that some individual utility functions contradict what he touts as rational preferences.[36] In doing so, Dr. Leonard errs in four ways.

38. First, it is critical to note that Dr. Leonard is confusing estimated parameters with actual data and is then making false inferences about estimated parameters rather than analyzing actual respondent choices.

39. Second, for the majority of the 24 percent of respondents the estimates for the two prices are so close that that a diligent statistician would consider the difference to be zero, rather than representing some form of irrationality. As explained in my Reply Report, I excluded respondents with utilities associated with $100 and $200 that are within one standard deviation of the difference in utilities between levels as a sensitivity analysis. When these respondents with such utility comparisons are excluded from the analysis, only 8.8 percent of respondents, not 24 percent, prefer a price of $200 over a price of $100.[37]

40. Third, what Dr. Leonard touts as "irrational," is, in fact, commonly accepted in marketing and consumer research: Some consumers display a tendency to shy away from a cheaper product in favor for a higher price; they are price-insensitive within a reasonable range of prices.[38] This fact is well documented in the literature and represents kinks in the demand curve.[39]

41. Fourth, the most crucial argument in the discussion of so-called irrational preferences, Google's experts misunderstand how the Bayesian approach informs individual estimates based on

---

[36] Declaration in Support of Google's Opposition to Motion to Exclude Portions of the Expert Reports of Gregory K. Leonard and Alan J. Cox, October 28, 2011, p. 24.

[37] See Reply Report, p. 19.

[38] See, for example, Mohr, Jakki, J., Sanjit Sengupta, and Stanley F. Slater, *Marketing of High-Technology Products and Innovations*, Third Edition, New Jersey: Pearson Prentice Hall, 2010; and "Smartphones: Building Profitability and Loyalty in the Mass-market," *WDSGlobal*, 2010, http://www.wds.co/enlightened/smartphone_profitability/smartphone_profitability_and_loyalty_wdsglobal.pdf.

[39] Lambert, Z.V., "Product Perception: An Important Variable in Price Strategy," *The Journal of Marketing*, Vol. 34, No. 4, October 1970, pp. 68-71, pp. 68-71.

aggregate population parameters during the multi-stage estimation process and that one should not evaluate isolated respondent estimates, as these methods are intended to characterize populations, not individuals. In these critiques, Google's experts are emphasizing outliers (which have little weight in the analysis), rather than recognizing the close approximation or fit of my results with actual market data.

42. By using such examples from individual respondents, Google's experts purposefully focus on individual parameters, and therefore ignore the idea behind a Hierarchical Bayesian model, such as the one that I use for my estimations. Specifically, Google's experts forget or ignore that while one could very well estimate individual parameters by fitting the individual respondent's preferences, the aggregate results would almost always suffer from overfitting of the data.[40] To avoid this overfitting in favor of precise aggregate results, the chosen Hierarchical Bayes approach allows individual parameters to be influenced by information from the whole sample. Hence, while some individual parameters might reflect small amounts of statistical noise, the aggregate estimation outcome is precise; in fact, it is considered the gold-standard in choice modeling by many marketing experts.[41] I have stated in deposition that it is the aggregate outcome of the sample, not individual values, that matters for my analysis: "[t]he analysis was done at the sample level, and so we looked at all the – the estimation of all the individual responses of all the individual respondents. I didn't examine individual questionnaires."[42]

43. Furthermore, given that this is an issue involving estimation and not the quality of the data, it can easily be eliminated by modifying the estimation. If one tried to account for Dr. Leonard's erroneous proposition that "No rational person, much less 24% of all rational people,

---

[40] Overfitting describes a model's characteristic to fit particular data too precisely and therefore lose its predictive power.

[41] Allenby, G. and P.E. Rossi, "Perspectives Based on 10 Years of HB in Marketing Research, *Sawtooth Software Research Paper Series*, 2003, http://www.sawtoothsoftware.com/download/techpap/allenby.pdf.

[42] Deposition of Steven M. Shugan, Ph.D., September 26, 2011, pp. 138-139.

would prefer to pay $200 for a phone they could have for $100,"[43] the outcome of a model using monotonic preferences for price yields similar results to those reported in the Shugan Report.[44]

44. Finally, it is not scientific to conclude that my survey is flawed simply because its results do not confirm Google's assumptions about consumer behavior. I have pointed out this flaw in Dr. Leonard's reasoning before. It is axiomatic in science that one should not substitute one's own view of what is correct for what the data show.[45]

DATED: February 24, 2012

/s/ Steven M. Shugan
STEVEN M. SHUGAN

[43] Google's Motion to Strike, p. 20.

[44] "According to these results, Android sales but-for the feature enhancements enabled by the patents-in-suit and the Java copyrights would have been at least 7.6 (instead of 7.9) percent lower if availability of applications was reduced and at least 20.0 (instead of 19.9) percent lower if application startup time was increased. Collectively, Android sales would have been at least 25.7 (compared to 25.7) percent lower but-for these infringements." (Reply Report, p. 20.)

[45] Lehmann, D.R., S. Gupta, and J.H. Steckel, *Marketing Research*, Massachusetts, Addison Wesley, 1998, p. 68.

ATTESTATION OF FILER

I, Steven C. Holtzman, have obtained Dr. Steven Shugan's concurrence to file this document on his behalf.

Dated: February 24, 2012

BOIES, SCHILLER & FLEXNER LLP

By: */s/ Steven C. Holtzman*
Steven C. Holtzman

Attorneys for Plaintiff
ORACLE AMERICA, INC.